

framed of the weather at all stations on any day of 1884, showing the quantity and nature of the rainfall, thunder, fog, dew, frost, transparency of the air, "sun-snake" (a phenomenon chiefly observed in the northern part of Sweden), aurora borealis, &c. Reports on the forming and breaking up of the ice have been received from fifty-eight stations, besides seventy-seven observations of periodical features of animal and vegetable nature.

THE Swedish Academy of Sciences has issued a work entitled "The Correspondence of Carl von Linnæus," containing a record of all the correspondents of this famous naturalist, Swedish as well as foreign, with their addresses, date of birth and death, &c., as well as the date of each letter to and from.

THE first African city lighted by electricity was not Algiers or Cairo, but Kimberley, with forty-two Brush lamps, each of 2000 candle-power. The current is also utilised there for the killing of dogs, a step suggesting the execution of death sentences by the same means, as proposed in America and in France by M. Charson, a member of the Senate.

MR. R. N. CUST, the Secretary to the Royal Asiatic Society, is engaged on a work on the languages of the tribes of Polynesia, including those of Australia.

THE additions to the Zoological Society's Gardens during the past week include a Squirrel Monkey (*Chrysothrix sciurea* ♂) from Guiana, presented by Madam G. Sangiorgi; a Macaque Monkey (*Macacus cynomolgus* ♀) from India, presented by Mr. D. Evans; a Rhesus Monkey (*Macacus rhesus* ♀) from India, presented by Capt. Pitman; a Common Cormorant (*Phalacrocorax carbo*), British, presented by Mr. O. Moulton Barrett; two Golden Eagles (*Aquila chrysaetus*) from Scotland, a Lined Finch (*Spermophila lineola*) from South America, deposited; two Ostriches (*Struthio camelus* ♂ & ♀) from North Africa; a Lear's Macaw (*Ara leari*) from South America; a Lineolated Parakeet (*Bolborhynchus lineolatus*) from Mexico, purchased; a Bennett's Wallaby (*Halmaturus bennetti* ♀), a Vulpine Phalanger (*Phalangista vulpina* ♂), three Canadian Beavers (*Castor canadensis*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

THE STRASBURG OBSERVATORY.—Herr W. Schur has published, in No. 2736 of the *Astronomische Nachrichten*, a supplementary report on the work done at the Strasburg Observatory during the ten months preceding May of this year, so as to exhibit the state of the instruments and of the computations relating to the observations made with them on the eve of his departure for Göttingen, where he has been appointed Director in the room of the late Prof. Klinkerfues. During the interval to which the report refers, Herr Schur was chiefly occupied with observations of the moon with the altazimuth and of comets with the great refractor, also with the examination of the micrometer-screw of the latter instrument. The meridian-circle has chiefly been employed in the observation of southern stars—amongst others the eighty-three stars of Auwers' Southern Fundamental Catalogue, and certain stars for investigating astronomical refractions. The direct and reflection observations to the end of the preceding year give for the geographical latitude of the meridian-circle, $+48^{\circ} 35' 0''.11$, which agrees well with a former determination with Repsold's transit, using Horrobow's method, viz. $+48^{\circ} 35' 0''.23$. In former reports Herr Schur has drawn attention to the discordance between the nadir points determined with observer north and observer south, which, for his observations, amounts to a considerable quantity; in the mean, from a large number of observations, $\frac{1}{2}$ (north-south) being as much as $+0''.50$. This large value agrees both in sign and in magnitude with the quantity determined from observations of zenith stars for similar positions of the observer, viz. $0''.77$, and Herr Schur concludes that his observed zenith distances of stars require a correction of about $-0''.6$. In the case of the other Strasburg observers, the corresponding correction is comparatively insignificant. Herr Schur's successor at Strasburg is Dr. Kobold.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1886 JULY 18-24

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on July 18

Sun rises, 4h. 6m.; souths, 12h. 5m. 56'.5s.; sets, 20h. 6m.; decl. on meridian, $21^{\circ} 1' N.$; Sidereal Time at Sunset, 15h. 52m.

Moon (two days after Full) rises, 20h. 42m.*; souths, 1h. 31m.; sets, 6h. 27m.; decl. on meridian, $14^{\circ} 5' S.$

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian
Mercury ...	6 41 ...	13 54 ...	21 7 ...	$13^{\circ} 21' N.$
Venus ...	1 33 ...	9 38 ...	17 43 ...	$21^{\circ} 46' N.$
Mars ...	11 3 ...	16 48 ...	23 33 ...	$3^{\circ} 38' S.$
Jupiter... ..	10 9 ...	16 18 ...	22 27 ...	$0^{\circ} 58' N.$
Saturn... ..	3 7 ...	11 15 ...	19 23 ...	$22^{\circ} 20' N.$

* Indicates that the rising is that of the preceding evening.

Occultations of Stars by the Moon (visible at Greenwich)

July	Star	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image
19 ...	ϵ^2 Aquarii...	5½ ...	3 30	near approach	$35^{\circ} 0'$
19 ...	ϵ^1 Aquarii...	6 ...	4 1	near approach	$220^{\circ} 0'$
24 ...	μ Ceti ...	4 ...	23 32	$0^{\circ} 24'$	$52^{\circ} 26'$

† Occurs on the following morning.

July	h.	Mercury at greatest elongation from the Sun,
19 ...	10 ...	27° east.

Variable Stars

Star	R.A.	Decl.	h. m.
U Cephei ...	0 52.2 ...	$81^{\circ} 16' N.$	July 18, 23 32 m
R Piscium ...	1 24.8 ...	$2^{\circ} 18' N.$	" 23, 23 11 m
S Ursæ Majoris ...	12 39.0 ...	$61^{\circ} 43' N.$	" 24, m
V Bootis ...	14 25.2 ...	$39^{\circ} 22' N.$	" 22, m
U Coronæ ...	15 13.6 ...	$32^{\circ} 4' N.$	" 21, 22 22 m
U Ophiuchi...	17 10.8 ...	$1^{\circ} 20' N.$	" 22, 2 58 m
X Sagittarii...	17 40.4 ...	$27^{\circ} 47' S.$	July 22, 23 6 m
U Sagittarii...	18 25.2 ...	$19^{\circ} 12' S.$	" 19, 2 0 m
S Vulpeculæ ...	19 43.7 ...	$27^{\circ} 0' N.$	" 24, m
χ Cygni ...	19 46.2 ...	$32^{\circ} 38' N.$	" 18, m
S Delphini ...	20 37.8 ...	$16^{\circ} 41' N.$	" 22, m
δ Cephei ...	22 24.9 ...	$57^{\circ} 50' N.$	" 18, 21 30 m

M signifies maximum; m minimum.

Meteor Showers

Meteors begin to be somewhat numerous in the latter half of the present month. Amongst the radiant represented are the following:—Near π Andromedæ, R.A. 10° , Decl. $38^{\circ} N.$; near β Cassiopeiæ, R.A. 6° , Decl. $58^{\circ} N.$; near η Draconis, R.A. 245° , Decl. $64^{\circ} N.$; near σ Serpentis, R.A. 266° , Decl. $12^{\circ} S.$; near α Cygni, R.A. 312° , Decl. $46^{\circ} N.$; from Lacerta, R.A. 342° , Decl. $40^{\circ} N.$; and the great *Pervid* shower, maximum August 10, radiant R.A. 45° , Decl. $56^{\circ} N.$, begins to furnish individual meteors about this time.

GEOGRAPHICAL NOTES

ACCORDING to the *Colonies and India*, the Secretary of the Victorian branch of the Geographical Society of Australasia has written to the Royal Society of Victoria asking the latter to appoint a committee to confer with that already appointed by the former Society on the question of sending an exploring expedition to the Antarctic regions. It is urged that a conference should take place as soon as possible, and that various scientific associations should be invited to co-operate in sending out one or more expeditions.

THE latest news from the Chitral Mission is that Col. Lockhart is returning to India from Zebah, in Badakshan, leaving Col. Woodthorpe in charge of the party.

It is stated that Mr. A. R. Colquhoun, who is at present Civil Commissioner at Mogoung, in Upper Burmah, is about to start

on a journey of exploration into Upper Assam, and the regions lying between this and Burmah.

THE latest official information concerning Dr. Wilhelm Junker, the African traveller, comes from Zanzibar. It reports that while he was staying with the King of Unyoro, the latter was attacked and defeated by the King of Uganda. The King of Unyoro and Dr. Junker succeeded, however, in making their escape. Dr. Junker lost all his collections, but saved his journals.

AT the March meeting of the Geographical Society of Stockholm it was decided not to distribute the *Vega* medal—the greatest honour the Society can confer—this year. Only three travellers have as yet received it, viz. Nordenskjöld, Pallander, and Stanley. The *Vega* fund was awarded to Dr. F. Svenonius, for explorations in the Lapland highlands during the summer.

A RECENT number of the *Verhandlungen* of the Berlin Geographical Society (Band xiii. No. 5), contains an important paper on Corea, by Dr. Gottsche, who travelled widely over the peninsula on behalf of the Japanese Government. During two journeys he traversed all the eight provinces of the country, and visited 80 of the 350 district towns. The general features are already tolerably well known to English students from Mr. Carles's reports laid before Parliament, and his paper in the *Proceedings* of the Royal Geographical Society, but as Dr. Gottsche is a geologist, and travelled specially for scientific observation, he supplements Mr. Carles's papers in this direction. The climate, he shows by meteorological tables, lies between that of Japan and of North China, while in the North the climate in winter is of almost Siberian rigour. As for the geological formation, granite, gneiss, and crystalline schists play a predominant part. Here and there these are broken by the older volcanic formations, as diabase and quartz porphyry; palæozoic strata occur rarely, and the later sedimentary formations not at all. Active volcanoes do not exist on the mainland, and earthquakes have been unknown within the memory of man. The only metal in which Corea is rich is iron; the belief that gold abounds is a delusion. The fauna is rich, and of much interest, for palæarctic and sub-tropical types meet here. With regard to the flora, unfortunately a large portion of Dr. Gottsche's collection was lost, and the remainder was handed to Dr. Engler of Breslau for examination and report. In conclusion, he says that though Corea may never be popular with the ordinary traveller for pleasure, it will well repay the visitor on scientific objects intent. Prof. Enting, who travelled in the interior of Arabia in 1883-84 on an antiquarian mission, especially in search of inscriptions, gives a long and comprehensive account of the regions through which he went.

THE new number (Heft ii. Bd. 9) of the *Deutsche Geographische Blätter*, the organ of the Geographical Society of Bremen, contains the conclusion of Dr. Oppel's paper on the Congo basin. The present instalment refers to the explorations of past years, the lower, central, and upper Congo region, north and south of the stream, the climate, meteorology, botany, zoology, ethnography, &c. It will thus appear that the paper is an encyclopædic one on the great West African river. The next paper is a continuation of Herr Valdau's account of his journey to the north of the Cameroons, especially around Lake Mbou, and between that and Balundu, and the coast. Herr Steinvorth gives a most interesting account of a little Slav colony or oasis in Hanover called the Hanoverian Wendtland, where the people down to this day have in great part preserved their original speech, customs, and other peculiarities. The writer describes all these in some detail, and comes to the natural conclusion that here we have not a pure Wendt people, but one largely mixed with Germans, and thinks, after discussing the peculiarities of the dialect spoken, that this colony is worthy of the attention of the student of comparative language. This is followed by a general article (which is anonymous) on the new Chilean province of Tarapaca, dealing especially with the silver mines and saltpetre industry. Herr Seelstrang supplies a paper of more direct geographical interest on the region about the source of the Rio Chubut, hitherto one of the least-known parts of the Argentine Republic. The rest of the number (which is of considerable size) is occupied by geographical intelligence, reviews of books, &c.

In the *Bolletino* of the Italian Geographical Society for May, Signor Sommier describes the excursion which he made with

Signor G. Cini to Cape North in January 1885. Some interesting attaches to this journey, which is the first made across Lapland and Finland in midwinter for purely scientific purposes. The travellers proceeded by train from Christiania to Thronthjem, and thence by steamer in darkness and storm to Hammerfest and Skarsvaag, in the island of Magerø, the northernmost group of habitations in Europe, and the nearest permanent settlement to Cape North. Here they received a friendly welcome from the local "Landelsmand," and reached the goal of the expedition on foot with much greater ease than had been anticipated. The weather was unusually calm and mild, with a temperature of only -2° C. At some points the evergreen lichens and other growths (*Betula nana*, *Empetrum nigrum*, *Diapensia lapponica*, &c.) were visible through some centimetres of transparent ice clothing the surrounding rocks. The only animals seen, besides the eider and other water-fowl, were the raven, crow, magpie, Arctic fox, and frankoline, the latter (*Lagopus mutus*) everywhere present in large numbers. Several photographs were taken, and after a stay of eleven days in the neighbourhood, during which the glass never fell below -16° C., the travellers returned by water to Hammerfest and Bossekop, at the head of the Alter fjord. Thence the route was continued overland under great hardships—eastwards to Lake Enare, southwards through Kittilå to Haparanda, and round the west side of the Gulf of Bothnia to Sundsvall, whence Stockholm was reached by train. At Karasjok, on the road between Bossekop and Enare, the travellers made the acquaintance of the same Lapp family that visited London last year, and much valuable information was collected on the Lapps, Quäns, and northern Finns. This forms the subject of two communications sent by Stephen Sommier to the *Archivio per l'Antropologia e l'Etnologia* (xvi., 1, 1886), and separately printed under the title of "The Lapps and Northern Finns." The account of the trip to Cape North has also been issued in separate form by the Italian Geographical Society (Rome, 1886).

THE LUNAR SURFACE AND ITS TEMPERATURE

A MONOGRAPH by the writer, relating to the temperature of the lunar surface, read before the American Academy of Science, September 1869, contained the following:—"Are we not forced to dissent from Sir John Herschel's opinion that the heat of the moon's surface, when presented to the sun, much exceeds that of boiling water? Raised to such a high temperature, our satellite, with its feeble attraction, could not possibly be without an envelope of gases of some kind. Indeed, nothing but the assumption of extreme cold offers a satisfactory explanation of the absence of any gaseous envelope round a planetary body, which, on account of its near proximity, cannot vary very much from the earth as regards its composition. The supposition that this neighbouring body is devoid of water, dried up and sunburnt, will assuredly prove one of the greatest mistakes ever committed by physicists." This assertion was based on demonstrations showing that the circular walls of the great "ring mountains" on the lunar surface are not, as supposed, composed of "mineral substances originally in a state of fusion." The height and diameter of these walls being recorded in "Der Mond," computations based on the safe assumption that the areas of their transverse sections cannot be less than the square of their height, establishes the important fact that the contents of the wall of, for instance, Tycho, the circumference of which is 160 miles, height 2.94 miles, amounts to $2.94 \times 160 = 1382$ cubic miles. The supposed transfer of this enormous mass, in a molten state, a distance of 25 miles from the central vent imagined by Nasmyth, and its exact circular distribution at the stated distance, besides its elevation to a vertical height of nearly 3 miles, involve, I need not point out, numerous physical impossibilities. Other materials and agencies than those supposed to have produced the "ring mountains" must consequently be sought in explanation of their formation. A rigid application of physical and mechanical principles to the solution of the problem proves conclusively that water subjected successively to the action of heat and cold has produced the circular walls of Tycho. The supposition that these stupendous mounds consist of volcanic materials must accordingly be rejected, and the assumption admitted that they are inert glaciers which have become as permanent as granite mountains by the action of perpetual intense cold.